AUSTRALIAN RESUPINATE HYDNACEAE.

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Key to the Genera.

Acia Karst.—Receptacle resupinate, thin, waxy. Spines slender, subulate, generally entire, distinct or connate at the base. Spores hyaline. Cystidia none. Cystidioles (more or less hair-like bodies, possibly sterile basidia) sometimes present, usually small and thin-walled.

Grandinia Fr.—Receptacle resupinate, thin, membranaceous, pellieulose or crustaceous. Tubercles or spines obtuse, or occasionally pointed, entire. Spores hyaline or faintly yellowish. Cystidia absent. Cystidioles rarely present, but little differentiated.

Odontia Fr.—Receptacle resupinate, thin, membranaceous, waxy, crustaceous or mealy. Spines conical, ciliate or penicillate at the apex. Spores hyaline. Cystidia present.

Acia Karst.

Acia subceracea Wakef., n. sp.

Effusa, arcte adnata, subceracea, alutacea, margine indeterminato. Aculei sparsi vel conferti, subulati, ceracei, fulvescentes vel castanei, apicibus pallidioribus. Subiculum alutaceum, tenue, ceraceo-membranaceum. Basidia cylindrico-clavata, 4-sterigmatica, 12 — 20 × 4 — 5 μ. Sporae ellipticae, hyalinae, uno latere depressae, 5 — 6 × 2 — 2·5 μ. Cystidiola sparsa, interdum rariora, hyalina, subulata, 45 — 60 × 3 — 5 μ, ad 40 μ emergentia. Hyphae basales dense intertextae, hyalinae, non nodosae, 2 — 3·5 (— 4) diametro.

Hab.—Ad lignum cariosum. Mount Lofty, South Australia, Cleland "H" (type); Mount Lofty, South Australia, Cleland "G"; National Park, South Australia, Cleland "I," "K."

Allied to *Acia uda* and *A. denticulata,* but distinguished from the former by the strongly projecting, pointed cystidioles, and from both by the absence of any bright yellow colouring. In structure it is most closely allied to certain *Corticia* of the group Ceracea, as *Corticium ochraceo-fulvum* Bourd. & Galz. *A. fusco-atra* sometimes has similar but much smaller cystidioles, and is darker in colour.

A. subfascicularia Wakef., n. sp.

Effusa, tenuis, arcte adnata, ceracea, e fulvo umbrina. Aculei primo minuti, fulvo-ochracei, demum majores (ad 0·5 mm. longi) fasciculati, umbrini, apicibus albidis. Basidia clavata, 20 — 24 × 3 — 4 μ, 4-sterigmatica. Sporae hyalinae, ellipticae, uno latere depressae, polari-guttulatae, 4 — 5·5 × 2 — 2·5 μ. Hyphae laxe intertextae, subhymeniales tenuiter tunicatae 2 — 3 μ, basales crasse tunicatae ad 6·5 diametro. Hyphae in aculeis erectae, arcte adhaerentes, saepe crystallorum circumvestitae, 2 μ diametro.

Hab.—Ad corticem. Mount Lofty, South Australia, Cleland "W," May 5, 1928.

The colour of the young state is nearest to pale tawny-olive of Ridgway's Colour Standards; of the mature fungus snuff brown. In general appearance it resembles brown forms of *Acia fusco-atra,* but differs in the marked fasciculate spines, the much looser basal tissue, and in the abundant deposits of rather large, irregular crystals in the central tissue of the spines. *H. fascicularia* B. & C., of

North America, has similarly fasciculate spines, and is close to this species in structure, but differs in the paler colour and much smaller spines.

GRANDINIA Fr.

Grandinia Clelandii Wakef., n. sp.

Effusa, tenuis, arcte adnata, tomentoso-membranacea, alutacea, granulis confertis irregularibus concoloribus, ambitu indeterminato, pulverulento. Basidia clavata vel urniformia, 40 — 50 × 8 — 9 μ, sterigmata 4, 6 μ longa. Sporae ellipticae, hyalinae, 10 — 11 × 8 μ. Hyphae hyalinae, laxe intertextae, septato-nodosae, 2·5 — 4 μ diametro, ramulis erectis saepe apice vesiculoso-inflatis.

Hab.—Ad corticem. New South Wales, Cleland "A," 1928.

A very distinct species. The colour is uniformly warm buff, and the texture somewhat loose, giving the plant a pulverulent or tomentose appearance when viewed with a lens. In section, the most marked character is the abundant vesicular bodies in which some of the upward-growing hyphae terminate. These recall the vesicles of *Stereum purpureum,* and, like those, occur only in the sub-hymenial tissue. Both basidia and spores are large for the genus.

G. australis Berk., in Hook. Fl. Tasm., 1860, p. 257.

Syn.: *Hydnum pexatum* Mass., in Kew Bull., 1901, p. 157.

Irregularly effused, closely adnate, membranaceous, at first alutaceous (deep chamois) with scattered granules, finally becoming between raw sienna and buckthorn brown, very uniform in colour, with crowded granules. The yellowish pigment is soluble in a solution of potassium hydrate with the production of a rich vinaceous tint. Margin indeterminate, narrowly byssoid at first, yellowish or concolorous. Hymenium cracked when dry. Basidia clavate or urniform, 25 × 5 μ, with 4 sterigmata 2 — 5 μ long. Spores broadly elliptical, one side slightly depressed, 6 — 7 (— 9) × 4 — 5 μ. Cystidioles present, but scattered, sometimes fusiform, and pointed, at other times scarcely differing from young basidia, projecting little from the surface of the hymenium, about 30 — 35 × 8 μ. Basal hyphae branched, septate, with clamp-connections 3·5 — 4 μ in diameter.

Hab.—On bark. New South Wales, Cheesman, 1914, and Cleland "B," 1928; Victoria, Martin 867 and 1111, 1892; Gippsland, Mar., 1884, on *Eucalyptus obliqua;* Tasmania, Cleland "C," "E," 1928, Rodway 340 (type of *H. pexatum)* and type of *G. australis.*

This species resembles *Odontia Archeri* in the vinaceous colour which is produced when sections are treated with potash, but differs from that species in its more uniform colour and the absence of vivid yellow tints in the subiculum, and microscopically in the shape of the spores and the absence of embedded encrusted cystidia.

G. farinacea (Pers.) Bourd. & Galz.

Effused, thin, floccose or softly membranaceous, at first pure white, finally cream-coloured, margin byssoid or indeterminate. Spines sometimes subulate, sometimes reduced to granules, very soft and fragile, with projecting sterile hyphae at the apex. Basidia 6 — 12 — 21 × 3 — 5 μ, with 2 to 4 sterigmata 3 — 4·5 μ long. Spores subglobose or ovate, finely asperulate, 3 — 4·5 × 2·5 — 4 μ. Hyphae thin-walled, with clamp-connections, 1·5 — 4 μ in diameter, sometimes swollen to 7μ at the septa.

Hab.—On rotten wood and bark. Kuitpo, South Australia, Cleland "M," August 29, 1928; Adelaide, South Australia, Cleland "T," September, 1928.

Easily recognised by the rough spores. A very common European species.

Odontia Fr.

Odontia arguta (Fr.) Quél.

Syn.: *Hydnum argutum* Fr.

Effused, thin, membranaceous, dry, margin indeterminate, tomentose, whitish. Hymenium cream to deep ochraceous, with granuliform or subulate spines usually more or less penicillate at the apex. Basidia clavate, 20 — 30 × 5 μ, with 4 sterigmata, accompanied by small cystidia or cystidioles of varying form, sometimes rounded above and excreting a globule of resinous matter, sometimes subulate and strongly encrusted at the apex. Spores ovate, often one-guttulate, 5 — 5·5 (— 6) × 4 μ. Hyphae hyaline, with clamp-connections, 2 — 3 μ in diameter.

Hab.—On bark and dead wood. Pilliga Scrub, New South Wales, Cleland "U," October 15, 1928; Brown's River, Tasmania, Cleland "F," January, 1928; National Park, Tasmania, Cleland "P," January, 1928.

The specimens "F" and "U" show the capitate type of cystidia, while in "P" the characteristic small encrusted cystidia are present. Typical specimens of *O. arguta* from New Zealand are present in the Kew Herbarium.

O. Archeri (Berk.) Wakef., comb. nov.

Syn.: *Corticium Archeri* Berk., in Fl. Tasm. II., 1860, p. 260; *Kneiffia Wrightii* B. & C., in Journ. Linn. Soc., X., 1869, p. 327; *K. chromoplumbea* B. & Br., in Journ. Linn. Soc., XIV., 1873, p. 62; *Corticium chrysocreas* B. & C., in Grevillea, I., 1873, p. 178; *Odontia Wrightii* (B. & C.) Burt, in Ann. Mo. Bot. Gard., XIII., 1926, p. 270.

Broadly effused, firm, fairly thick, but not waxy, closely adnate, at first thin, even or more or less papillate, later with distinct spines, becoming much thicker, and, when dry, often cracked into small areolae. Hymenium variable in colour, yellow ochre when young and actively growing, but becoming cinnamon-buff or olive-buff, then avellaneous or wood brown with age. Margin indeterminate, at first buff-yellow or Empire yellow, later concolorous with the hymenium. Subiculum similarly bright yellow at first, but in old specimens the tissue exposed in the cracks often appears white, probably on account of the abundant excretion of crystals from the tissues.

The structure in section is very characteristic, but can only be observed well in young specimens. Numerous cystidia are present, both embedded in the tissues and projecting slightly from the hymenium. These are small, shortly fusiform, thin-walled and hyaline at first, 18 — 20 × 6 — 8 μ. Later the embedded cystidia become strongly encrusted with a deep yellow, apparently resinous excretion, which is soluble in a solution of potassium hydrate with the production of a vinaceous tint. It is insoluble in lactic acid, and the structure is best observed in sections mounted in this medium. The encrusted cystidia eventually occupy considerable space in the subhymenial tissues, and appear to be vesicular bodies, as described by Burt for *Corticium chrysocreas*.

Basidia 15 — 20 × 4·5 μ, with 4 sterigmata, 3 μ long. Spores hyaline, elliptical, one side depressed, sometimes 2-guttulate 4·5 — 5 (— 6) × 2 — 2·5 μ. Basal tissue at first somewhat compact, later the hyphae appear to be loosely interwoven, hyaline, thin-walled 3 — 4 (— 5) μ in diameter. The tissue in older specimens contains much mineral matter in the form of crystals, often forming masses in the central tissue of the spines.

Hab.—On bark. Mount Lofty, South Australia, Cleland "V," May 5, 1928, and "S," June 23, 1928; Mosman, Sydney, New South Wales, Cleland "D," May 4, 1919; Brown's River, Tasmania, Cleland "Q," January 30, 1928.

Known also from Ceylon, Cuba and the United States. A species very variable in appearance according to age. Young plants are easily recognisable from their brilliant yellow tints, but older specimens are best detected roughly by treating sections with a solution of potash, when there is always an evanescent vinaceous tinge. The cystidia and spores distinguish it from *Grandinia australis*. *Corticium Archeri* Berk., as to the type specimen, is an old cracked form, with now no yellow visible to the eye. Burt has distinguished *Odontia Wrightii* from *Corticium chrysocreas* on the ground that it possesses no vesicles. The type specimen of *O. Wrightii* was originally a young, thin specimen with few cystidia. It has been, at some time, treated with an alcoholic poisoning solution which has destroyed the yellow colouring matter. Nevertheless, careful examination of sections shows some trace of the embedded, encrusted bodies having been present, and the typical thin-walled conical cystidia occur in the hymenium. There are at Kew recent American specimens which are strongly odontioid in habit, and at the same time show the internal structure which is typical of *"Corticium chrysocreas."* As *Archeri* is the earliest specific epithet so far traced, it has been adopted for the species.

SPECIES EXCLUDENDAE.

Grandinia glauca Cooke.

This is not a true *Grandinia*, the spines being fascicles of sterile brownish hyphae covered with deposits of crystals. The fungus may be placed in the genus *Epithele*. At the same time, the structure is so closely allied to that of species of *Grammothele*, such as *G. grisea* B. & C. and *G. cineracea* Bres., that it is possible that it may be a state of a species of *Grammothele*, just as *Kneiffia grisea* belongs to *G. grisea*, according to Bresadola. The Australian plant, however, both the type specimen and a recent collection by Dr. Cleland, shows no trace of the development of either pores or true hydnoid spines, and is certainly distinct from *G. cineracea* in its longer spores, which are cylindric-ellipsoid, one side depressed, $8 - 9 \times 2 - 2{\cdot}5\ \mu$.

Odontioid forms occur in certain species of *Corticium*. Such forms have been observed in *C. lividum*, *C. bombycinum*, and *Peniophora setigera* from Australia.